C-A OPERATIONS PROCEDURES MANUAL

9.1.17 Procedure for Establishing Integrating NMC Response in a Beam Line

Text Pages 2 through 4

Hand Processed Changes

HPC No.	Date	Page Nos.	Initials

Approved: _____**Signature On File**_____ _____
Collider-Accelerator Department Chairman Date

D. Gassner

9.1.17 Procedure for Establishing Integrating NMC Response in a Beam Line

1. Purpose

To provide instructions for liaison physicists and Radiological Control Technicians (RCT) for establishing the integrating NMC response as a function of particle beam intensity in a beam line prior to setting the operating limit. For NMC units in which the alert limit is used to set a lower operating limit, then the response of the alert level must be established. In this case, replace the words "alarm level" with the words "alert level" in the procedure.

2. Responsibilities

2.1 The liaison physicist is responsible to ensure a stable beam of known intensity is available.

2.2 The Radiological Control Technician (RCT) is responsible to determine the alarm setting for a particular particle intensity.

3. Prerequisites

3.1 There must exist an associated Radiation Safety Check-off List, or written permission from the Radiation Safety Committee (RSC) to change intensity.

3.2 This procedure requires a liaison physicist and Radiological Control Technician (RCT).

4. Precautions

Area surveys should be conducted prior to and during this procedure to ensure that this procedure does not produce unnecessary dose or risk to areas that can be occupied by personnel.

5. Procedure

5.1 Set the integrating threshold potentiometer located on the integrator board to 9.99. (RCT)

5.2 The liaison physicist shall ensure that a stable beam condition has been established.

5.3 The liaison physicist shall establish a beam intensity of approximately 1/10 of the intended operating limit stated on the associated beam line check-off list.

5.4 The liaison physicist shall record the particle intensity.

5.5 Depress the calibrate button. (RCT)

5.6 Set the range dip switch by using the following chart as a guide to the meter readings. (RCT)

> **Note:**
> The actual rate in mR/hr will not be what the meter reads because of the paddle assembly.

Alarm Level, R/h (meter)	Switch Setting
R > 10k mR/hr	4
1k mR/hr < R < 10k mR/hr	3
100 mR/hr < R < 1k mR/hr	2
R < 100 mR/hr	1

5.7 Note the meter reading during a typical beam pulse and set the range dip switch to a range that includes this reading. (RCT)

5.8 Adjust the integrating trip threshold potentiometer until the Integrating Interlock signal starts tripping. (RCT)

> **Note**:
> Listening or watching the relay is sufficient, as is monitoring the Interlock Trip signal with a voltmeter.

5.9 Release the calibrate push-button. (RCT)

5.10 Record the potentiometer reading. Record the analog meter reading. (RCT)

5.11 Repeat steps 5.1 and 5.10 until a minimum factor of 2 up to a preferred factor of 10 times the operating intensity limit stated on the associated beam line check-off list is reached.

5.11.1 Use a minimum of three intensity points.

5.12 For the two highest intensities, set the dip switch to the next highest range to make the potentiometer adjustments. (RCT)

5.13 Plot the data. Plot integrating trip threshold potentiometer setting versus the particle intensities. Make a note of the analog meter reading at each intensity. (LP)

5.14 The response curves should allow for the trip limit to be set with an accuracy of 50% of the designated operating limit. (RCT)

5.15 Press the red alarm button and adjust the alarm potentiometer until the analog meter reading equals 2 times the meter reading corresponding to the integrating trip limit chosen. (RCT)

5.16 Attach the data and the plots to the associated beamline Radiation Safety Check-off List. (LP)

5.17 Fill out the NMC Setup Card with appropriate information, and leave it in the NMC enclosure. (LP)

5.18 Exceptions to this procedure must be approved by the liaison physicist, and Facility Support (FS) representative, and the C-A Radiation Safety Committee Chair, or designee.

6. Documentation

6.1 Data and plots attached to the beamline check-off List.

6.2 NMC Setup Card

7. References

None.

8. Attachments

None.